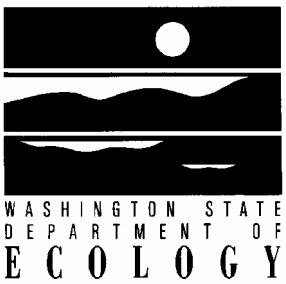

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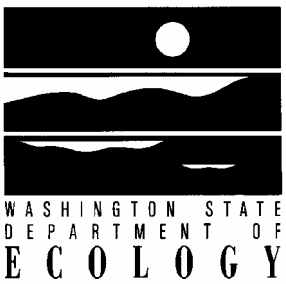

Washington Ranking Method

Scoring Manual

Prepared for:
Washington State Department of Ecology
Toxics Cleanup Program
Olympia, Washington 98504-7600

Prepared by:
Science Applications International Corporation
Olympia, Washington

and

Parametrix, Inc.
Bellevue, Washington

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Nothing
would be done at all
if a man waited
til he could do it so well
that no one could
find fault with it.

- Cardinal Newman

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1.0 INTRODUCTION

1.1 EXECUTIVE SUMMARY

A quantitative method for ranking hazardous waste sites has been developed for the state of Washington to satisfy the requirements of the Model Toxics Control Act. The model relies on information available from site hazard assessments to assess the potential for risks posed by contaminated sites. The ranking of sites provides a basis for program planning and priority assessment for those sites identified as potential threats to human health or the environment.

The model has four routes: surface water, air, ground water, and marine sediment. Within each route, data elements are evaluated in three main subcategories. These are:

- Substance characteristics,
- Site characteristics or migration potential,
- Exposure targets.

Site scores can be generated for seven pathways:

- Surface Water - Human Health,
- Surface Water- Environmental,
- Air - Human Health,
- Air - Environmental,
- Ground Water - Human Health,
- Sediment - Human Health,
- Sediment - Environmental.

A multiplicative and additive algorithm combines the values from these subcategories, resulting in a numerical route score between 1 and 100. The subsequent combination of all applicable pathway scores (e.g., surface water, air, ground water and sediment), using a simple scaling method, produces a single priority value for human health and/or for environment. These two priority values are further combined in a matrix to provide a final single rank for the site.

Thus, the ranking method provides several types of information about the relative risks posed by a site. It provides individual exposure pathway scores and a more general overall relative risk ranking. This information can be used by Ecology, along with other established factors, in setting its priorities for cleanup actions.

This manual includes a general introduction and background information on the programmatic framework and objectives of the model. The manual explains the structure of the algorithm and the data elements required to generate scores for surface water, air, and ground water routes. Procedures for scoring the sediment pathways are included in the Appendix, "Sediment Scoring Route". Site file information can be supplemented by data acquisition activities described in the manual. Worksheets are provided to guide scorers through a screening process to select hazardous substances and waste management practices to be used for scoring each route. After data collection and initial screening activities are completed, pathway scores for surface water, air, and ground water routes are generated by following the instructions provided in this manual. To score pathways involving contaminated Puget Sound marine sediments, refer to the Sediment Route Scoring Procedure Appendix.

The model has been developed to avoid reliance on specialists and sophisticated data interpretation; instead, scoring teams should comprise individuals with scientific training and experience in hazardous waste investigations who can exercise professional judgement where needed. Consistency in the scoring effort will require that the scoring team be kept small (no more than five people) with an equally small quality assurance team.

1.2 LEGAL AND REGULATORY FRAMEWORK

The 1987 Hazardous Waste Cleanup Act passed by the Washington State Legislature contained a directive for the development of a hazard ranking system to be adopted by July 1988:

> *"The department shall adopt rules ... to establish criteria for determining priorities among hazardous substance sites. These criteria shall assure that sites are ranked by a system that objectively and numerically assesses the relative degree of risk at such sites."*

The Department of Ecology (Ecology) subsequently adopted a Hazard Ranking System Regulation (WAC 173-338) on July 15, 1988, which established criteria for evaluating sites, and established the basis for developing a detailed scoring procedure.

In November 1988, the people of the state of Washington passed a citizens' initiative for a new hazardous waste cleanup law, called the Model Toxics Control Act (MTCA), repealing the Hazardous Waste Cleanup Act. The new law also called for the development of a ranking system.

> *"The department ... shall adopt ... rules under chapter 34.04 RCW to ... establish a hazard ranking system for hazardous waste sites."*

Ecology contracted with Science Applications International Corporation (SAIC) to assist in the development and field testing of a ranking model in October 1988. On January 3, 1990, Ecology filed a comprehensive regulation to implement major portions of the Model Toxics Control Act. This rule, entitled the Model Toxics Control Act Cleanup Regulation (Chapter 173-340 WAC), adopts the Washington Ranking Method (WARM) for the assessment of relative potential risk posed by sites to human health and the environment. The rule states that if the department determines that further action is required at a site, the site shall be ranked and placed on the state hazardous sites list. Notice shall be given by Ecology to the site owner and/or operator, and any other known potentially liable person(s), prior to publication of the site's rank on the state site register.

Before the state initiates action at a site, the department has the discretion to rerank it if the department receives additional information which indicates that a significant change may result in the site's rank.

1.3 OBJECTIVES

Major objectives in the development of the Washington Ranking Method (WARM) were as follows:

- To provide a consistent, objective means for assessing the relative potential risk posed by contaminated sites to human health and the environment, differentiating between those sites where there may be an environmental threat without a human health threat;
- To provide a model which would be scientifically defensible, and yet easy to use;
- To provide a model which would maximize accuracy and reproducibility with minimum data;